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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re The Application of:)
Larry S. Yaeger et al.)
Serial No.: 09/520,206)
Filed: March 7, 2000)
For: METHOD AND APPARATUS)
FOR ACQUIRING AND OR-)
GANIZING INK INFORMA-)
TION IN PEN-AWARE COM-)
PUTER SYSTEMS)

Examiner: Le, Brian Q.

Art Unit: 2623

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

REMARKS

In response to the Office action mailed July 9, 2003, applicants submit the following remarks.

In the Office, claims 1 and 16-17 were rejected under 35 U.S.C. §102(b) as anticipated by U.S. Patent No. 5,517,578 to Altman et al. ("Altman"). Claims 2-15 and 18-36 were rejected under 35 U.S.C. §103 as being obvious based on Altman in view of U.S. Patent No. 5,682,439 to Beernink ("Beernink"). As set forth on p. 8 of the Office action,

independent claim 27 actually appears to have been rejected under §102 based solely on Altman.

Applicants respectfully traverse the rejections. As set forth in detail herein, the art of record, including Altman, fails to provide any disclosure or appreciation for trying to organize ink strokes in terms of ink phrases. For this reason, applicants respectfully request that the rejection be withdrawn.

Description of the Present Invention

The present invention is directed to a specific technique for improving the recognition accuracy of "ink" information collected from a person using a "pen" to input information into a pen-based computer. Specifically, an ink manager, which is the entity that acquires and collects the ink strokes entered by the user, is specially configured to organize the collected ink strokes into discrete "ink phrases". To do this, the ink manager includes an ink phrase termination engine that, in turn, is programmed to constantly check for the occurrence of one or more events (referred to as "ink phrase termination events"). Upon the occurrence of such an ink phrase termination event, the ink manager stores all of the ink strokes, that have been acquired up until the detected event, into their own ink phrase data structure, thereby separately organizing and storing ink strokes in terms of ink phrases. The ink manager also signals to the handwriting recognition engine to provide recognition results for the respective ink phrase. The recognition results are then passed to the particular application (e.g., a word processing application) that the person was running while entering the ink strokes.

Description of the Cited References

Altman discloses a pen-based computer that allows the user to seamlessly switch between a word processing mode, where the ink strokes being entered represent words, and a drawing mode, where the ink strokes correspond to drawings rather than words. See Abstract. When operating in word processing mode, all ink strokes received by the device are passed to the writing layer, which attempts to recognize what the user is writing. See Col. 5, lines 32-34 ("All strokes that can be processed by the writing layer are sent to the writing layer"). At the writing layer, the ink strokes are organized (not into phrases), but into lines. The term "line", moreover, corresponds to the lines on a sheet of paper. See Col. 6, lines 27-29 ("the ink strokes are grouped into or associated with lines as noted in step 61. A line operates just as a normal writing line on a ruled sheet or (sic) of paper"). The writing layer then attempts to recognize the words formed by the ink strokes of a given line. See Col. 8, lines 17-20 ("the word parsing method begins at step 251 by sorting the strokes associated with a line in left-to-right order based on the left most point in the stroke"). Thus, one of the objects of Altman is to segregate ink strokes into lines (where the lines correspond to the lines on a piece of paper), and to apply recognition analysis to the ink strokes making up each line.

Beernink discloses a mechanism for allowing a user of a pen-based computer to correct inputs that the computer recognized incorrectly. According to Beernink's mechanism, the recognition results, e.g., the word the recognizer thinks the user entered, is displayed in a correction box for examination by the user. With the proposed word in the

correction box, the user can make changes, e.g., removing letters mistakenly added, splitting the recognized "word" into multiple words, etc.

Differences Between the Present Invention and the Cited References

Claims 1-15

Apparatus claim 1, in relevant part, recites:

"a pen driver coupled to the pen-based input/display tablet and configured to collect and organize the ink information entered at the pen-based input tablet into ink strokes", and

"an ink manager coupled to the pen driver for receiving the ink strokes, the ink manager having an ink phrase termination engine configured to examine the ink information collected the by the pen driver and, upon detecting the occurrence of an ink phrase termination event, to identify a respective end of ink phrase to the ink manager", and

"whereby the ink manager stores the ink strokes received prior to the ink phrase termination event in a selected ink phrase data structure".

That is, applicants' invention specifically recites the existence of an ink phrase termination engine that is looking at the incoming ink strokes and trying to determine whether an ink phrase termination event has occurred. When the occurrence of such an event is detected, the ink phrase termination engine notifies the ink manager causing it to store the ink strokes corresponding to that particular ink phrase in their own ink phrase data structure. In this way, ink strokes corresponding to different ink phrases are organized separately from each other.

Applicants respectfully submit that Altman fails to provide any such disclosure or teaching. In particular, Altman is concerned with determining what ink strokes belong on the same line, not which ink strokes belong to any particular phrase. Indeed, the word "phrase" nowhere even appears in Altman, thereby confirming that Altman is not interested in phrases at all.

At page 2, the Office Action cites to Col. 8, lines 55-67 of Altman as disclosing applicants' claimed "ink manager having an ink phrase termination engine configured to examine the ink information collected by the pen driver and, upon detecting the occurrence of an ink phrase termination event". The Office Action then cites to Col. 16, lines 5-12 of Altman as disclosing applicants' claimed feature "to identify a respective end of an ink phrase to the ink manager". Applicants' respectfully submit that a fair and proper reading of Altman, including the cited excerpts, demonstrates that Altman fails to disclose the claimed invention.

First, the excerpt at Col. 8, lines 55-67 of Altman deals with Altman's character recognition algorithm. It has nothing to do with an ink phrase termination engine looking at unrecognized ink strokes for the occurrence of an ink phrase termination event. In particular, Col. 8, lines 55-67 of Altman, states that:

"These calculations [i.e., the calculations of the average width of a character, the average calculated distance between adjacent character center points, the average calculated space between characters, and the average calculated space between words] are preferably computed using fuzzy logic. Fuzzy membership functions are practically expressed using a trapezoid function of four points. The first point . . .

In other words, Altman is not talking about ink strokes at all. Instead, Altman is talking about the subsequent processing that takes place after the ink strokes have been recognized as characters and words. This excerpt from Altman contains no disclosure of an ink phrase termination engine that is configured to detect the occurrence of an ink phrase termination event.

The second excerpt from Altman, i.e., Col. 16, lines 5-12, similarly fails to disclose applicants' invention. This excerpt deals with the manner of distinguishing between line-type elements (shown in Fig. 9A) from shape-type elements (shown in Fig. 9B), while the user is in drawing mode. More specifically, the excerpt states that:

"In order to determine whether a stroke is a line type [see element 186, Fig. 9B] or a shape type [see element 180, Fig. 9A] the present method compares the beginning and ending points of the stroke with the bounding box for the stroke. If the beginning point and ending points are within a predetermined distance of the opposite corners of the bounding box the stroke is a line type element."

Here again, there is no disclosure by Altman of any ink phrase termination engine that detects the occurrence of an ink phrase termination event. Instead, this excerpt of Altman discloses a way of determining whether one particular ink stroke is a shape or line, while the user is in drawing mode.

Claims 16-26

Method claim 16, in relevant part, recites:

"identifying when the pen is lifted from the tablet so as to organize the ink information into corresponding ink strokes", and

“organizing the ink strokes into one or more ink phrases as defined by one or more ink phrase termination events”.

In other words, with the present invention, ink information is first organized into individual strokes. This first level of organization, moreover, takes place after the user has lifted the pen from table. The present invention then goes on to further organize the ink strokes into one or more ink phrases based upon the occurrence of one or more ink phrase termination events.

In rejecting this claim, the Office Action cites to Col. 6, lines 53-63 and to Col. 16, line 5 of Altman. An examination of these excerpts, however, reveals that Altman fails to disclose the present invention. At Col. 6, lines 57-59, Altman states that:

“The present invention first divides the strokes into chained groups, and then associates all the strokes in a chained group with a line.”

In other words, as mentioned above, Altman is concerned with collecting all of the ink strokes that appear on any given line, whether or not those ink strokes happen to correspond to numerous ink phrases. Altman’s line-based organization model provides no disclosure of organizing ink strokes in terms of ink phrases, several of which may occur on a single line, or the creation of ink phrase termination events to help in separating one ink phrase from another.

Claims 27-36

Like the previously discussed independent claims, claim 27 recites program instructions for:

“examining the ink information to determine whether an ink phrase termination event has occurred”, and

“in response to the occurrence of an ink phrase termination event, segregating the ink strokes received prior to the termination event in a designated ink phrase data structure”.

As explained above, Altman is directed to a mechanism for determining when new ink strokes appear on a different line relative to previously entered ink strokes. Altman then organizes the ink strokes in terms of lines, not ink phrases.

Applicants submit that the application is in condition for allowance and early favorable action is requested.

Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,



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